American River Basin: Downtown Combined Sewer Upsizing Project

Attachment 6: Monitoring, Assessment and Performance Measures

Overview

Presented in this attachment are draft monitoring, assessment and performance measures for the City of Sacramento's Downtown Combined Sewer Upsizing Project, one of three projects that comprise the American River Basin (ARB) Integrated Regional Water Management (IRWM) Proposition (Prop) 1E Stormwater Flood Management Grant set of proposals. The Project Performance Measures table included herein presents the following project-specific information:

- Project goals
- Desired outcomes
- Output indicators – measures to effectively track output
- Outcome indicators – measures to evaluate change that is a direct result of the work
- Measurement tools and methods
- Measurable targets that are feasible to meet during the life of the Proposal

The Project Performance Measures presented below will be used to develop a Project Performance Monitoring Plan that includes monitoring criteria and an implementation schedule for the Downtown Combined Sewer Upsizing Project. This plan will be established and administered to assess and evaluate the project's performance and as a tool for reporting on its implementation. The cost for preparing the Project Performance Monitoring Plan is included in each project budget, in Budget Category (g) Other Costs. The implementation of the Project Performance Monitoring Plan will be conducted under Budget Category (e) Environmental Compliance/Mitigation/Enhancement.

In compliance with the four Groundwater Management Plans for the region, the ARB IRWMP participants have an extensive groundwater monitoring network for monitoring water elevation and quality, and to a lesser extent, land subsidence. These monitoring activities help the ARB region maintain the quantity and quality of groundwater through meeting pre-determined Basin Management Objectives (BMOs). Any groundwater data collected as part of this Project will be incorporated into the data collection and analysis currently underway. Additionally, at the State level, data will be disseminated to the Surface Water Ambient Monitoring Program (SWAMP) and the new California Statewide Groundwater Elevation Monitoring (CASGEM) Program, as applicable. Data will also be disseminated to California Department of Water Resources (DWR) for inclusion in its databases such as the Water Data Library, which contains groundwater level and water quality data.

Project Summary

The City of Sacramento's Combined Sewer System (CSS) serves the Downtown, East Sacramento and River Park, Land Park, Curtis Park, and Oak Park neighborhoods and totals 7,500 acres of the City. An additional 3,800 adjacent acres contribute sanitary sewer to the system, but the stormwater drainage is separate. These areas were separated as a result of efforts in the past to improve operational efficiency by diverting drainage and thus reduce the surcharging caused by high runoff flows. The CSS also includes two major pumping plants, Sump 1/1A and Sump 2/2A, and treatment plants that perform primary treatment (the Combined Wastewater Treatment Plant and Pioneer Reservoir).

In 1990, the Central Valley Regional Water Quality Control Board (Regional Board) served the City with a Cease and Desist Order that directed the City to devise a plan to reduce its combined sewer overflows (CSOs) and CSS outflows. Over the next four years, the City developed the Combined Sewer System Improvement Program (CSSIP), obtained approval from the Regional Board and City Council, and since then has largely implemented it. This effort, with the ultimate goal of eliminating CSS outflows for 10-year, six hour storms, has resulted thus far in reduction in outflow volumes of about 60% since the inception of the CSSIP, based upon hydraulic model results. This was achieved by increasing pumping capacity at Sump 1/1A and at Sump 2, and by constructing additional in-line and offline storage. Remaining projects in the first part of the CSSIP mostly consist of completing the Downtown Sewer Upsizing Project, which, thus far, has been designed and constructed in sections due to funding constraints.

To complete the Downtown Combined Sewer Upsizing Project, it is necessary to continue the "upsizing" in 7th Street to connect with a section upstream that was constructed out of sequence due to timing constraints, and to extend this network of upsized pipes in L, G, F, and 8th Streets. For the project to function properly, it is necessary that it be continuous, without the bottleneck sections that currently exist. Once completed, the network of upsized and parallel pipes will serve to lower the hydraulic grade line in this portion of the City with critical and high value real estate that has experienced flooding of combined sewer in the past. The Downtown Combined Sewer Upsizing Project will be implemented in three phases, replacing existing pipelines with larger pipes, paralleling existing pipeline, or by connecting new pipes to upsized portions, whichever approach is determined to be most practical. Phase 1 of the project will address the pipeline on P Street between 5th and 7th Streets, and on S Street between 14th and 17th Streets. Phase 2 of the project will retrofit or replace the pipeline on 7th Street from P Street to K Street, while Phase 3 of the project will retrofit or replace the pipeline on G Street from 7th Street to 9th Street and on F Street from 13th Street to 15th Street.

Project Performance Measures Table

A Project Performance Measures table has been created for the Downtown Combined Sewer Upsizing Project to indicate the project goals, desired outcomes, output indicators, outcome indicators, measurement tools and methods, and targets (Table 1). This table will be updated prior to project implementation and will be used to assess and evaluate the implementation and performance of the project, and as a means of reporting on the projects achievements relative to its overall goals.

Some of the monitoring measures that will be conducted as part of the project performance monitoring program include reviewing field recordings to compare the number of feet of increased diameter pipeline before and after construction, comparing pipeline records during 100-year 6-hour events pre- and post-construction, comparing bacterial levels in Sacramento River water samples pre- and post-project implementation, and evaluating the reduction in the number of combined sewer outflows during storm events pre- and post-construction. These measures will help evaluate the output indicators and outcome indicators to ultimately determine to what extent the project is meeting its goals and desired outcomes.

Table 1: Downtown Combined Sewer Upsizing Project Performance Measures Table

Project Goals	- Reduce flood damage in downtown Sacramento - Improve water quality through the reduction of raw sewage releases - Protect public health by reducing the likelihood of contact with raw sewage - Leverage existing funding by replacing aging infrastructure
Desired Outcomes	- Increased sewer size - Reduce hydraulic head in project area - Reduce number of combined sewer outflows (releases or overflows)
Output Indicators	- Field inspection records - Sewer flow monitoring - Reports of CSOs and CSS outflows during 10-year 6-hour storm events
Outcome Indicators	- Number of feet of upsized piping placed - Change in hydraulic grade line (HGL) in sewer during high flow events - Public and City reports of outflows
Measurement Tools and Methods	Tool - field records Method - compare number of linear feet of increased diameter pipeline before and after the project Tool – water level monitoring field records Method - comparison of water levels in sewer lines in project area during 100-year 6-hour events before and after project completion Tool – field records Method – compare number of houses inundated during design storms both before and after the project Tool - reports of combined sewer outflows Method - comparison of number of combined sewer outflows during 10-year 6-hour storm before and after project
Targets	- Upsizing of 5,792 linear feet of combined sewer piping - One foot reduction in HGL in CSS in the downtown Sacramento area - 7% reduction in number of combined sewer outflows - Removing 77 structures from the inundation area